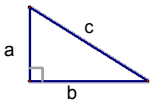
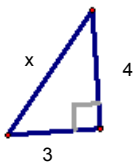
7.1 Apply the Pythagorean Theorem

Thm 7.1--The Pythagorean Theorem--In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs

$c^2 = a^2 + b^2$



President Garfield



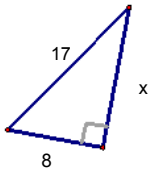
$x^2 = 3^2 + 4^2$

$\sqrt{x^2} = \sqrt{9+16}$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$x = 5$



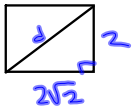
$17^2 = x^2 + 8^2$

$289 = x^2 + 64$

$225 = x^2$

$15 = x$

Find the diagonal of the rectangle with width of 2 and a length of $2\sqrt{2}$



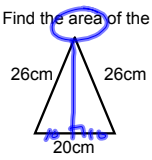
$d^2 = 2^2 + (2\sqrt{2})^2$

$d^2 = 4 + 8$

$d^2 = 12$

$d = 2\sqrt{3}$

Find the area of the isosceles triangle.



$26^2 = h^2 + 10^2$

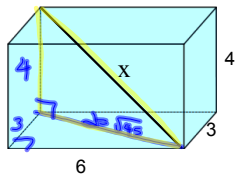
$676 = h^2 + 100$

$24 = h$

$A = \frac{1}{2}bh$

$\frac{1}{2}20 \cdot 24$

$A = 240\ cm^2$



$d^2 = 3^2 + 6^2$

$d = \sqrt{45}$

$X^2 = 4^2 + \sqrt{45}^2$

$X^2 = 16 + 45$

$X^2 = 61$

$X = \sqrt{61}$

Pythagorean Triples

3 4 5 5 12 13 8 15 17 7 24 25

6 8 10 10 24 26

9 12 15

7.2 Use the Converse of the Pythagorean Theorem

Theorem 7-2 The Converse of the Pythagorean Theorem--If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle.

If $c^2 = a^2 + b^2$, then it's a Right $\triangle$

If $c^2 < a^2 + b^2$, then it's an Acute $\triangle$ (Thm 7.3)

If $c^2 > a^2 + b^2$, then it's an Obtuse $\triangle$ (Thm 7.4)

c is the longest side

Examples

3, 7, 8 $8^2 \; ? \; 3^2+7^2$

Obtuse $64 > 9+49$

58

8, 16, 17 $17^2 \; ? \; 8^2+16^2$

Acute $289 < 64+256$

$\sqrt{5}$ $\sqrt{20}$ 6 $36 \; ? \; 20+5$

2. 4.

Obtuse

HW
p436-438 #s 3-5, 8,11-13, 24, 29
p444 #s 15-23